AMENDMENTS TO THE CLAIMS

Claims 1-47 (Canceled).

Claim 48 (Previously Presented). An automatic gain control ("AGC") for providing automatic gain control with an adaptive gain level comprising:

an automatic gain control circuit to provide an automatic gain controlled output signal;

an output power block for providing output power of the automatic gain controlled output signal;

an adder for determining an error signal in accordance with the output power of the automatic gain controlled output signal; and

a gain lookup table for storing gain values, wherein (i) the gain table is adapted in accordance with the error signal; and (ii) the gain table is capable of providing the gain values in accordance with an index formed by a function comprising:

$$q(t) = \left(\frac{TABLE\_SIZE - 1}{THSAT - THQUIET - 1} \right)(P_{in}(t) - THQUIET)$$

wherein *TABLE_SIZE* comprises a number of entries in the gain; *THSAT* and *THQUIET* comprise threshold levels, and $P_{in}(t)$ comprises an input power level.

Claim 49 (Previously Presented). A method of providing an automatic gain control system comprising a gain lookup table with an adaptive gain level comprising the steps of:

providing an automatic gain controlled output;

estimating an output power of the automatic gain control system;

forming an error signal in accordance with the output power of the automatic gain control system;

generating an address to access the gain lookup table as a function of an input power level where the function comprises:

$$q(t) = \left(\frac{TABLE\_SIZE - 1}{THSAT - THQUIET - 1} \right)(P_{in}(t) - THQUIET)$$

wherein *TABLE_SIZE* comprises a number of entries in the gain, $P_{in}(t)$ comprises the input power level; and *THSAT* and *THQUIET* comprise threshold levels; and

adapting the gain lookup table in accordance with the error signal.

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Claim 50 (Currently Amended). <u>An automatic gain control ("AGC") for providing automatic gain control with an adaptive gain level comprising:</u>

  <u>an automatic gain control circuit to provide an automatic gain controlled output signal;</u>

  <u>an output power block for providing the output power of the automatic gain controlled output signal;</u>

  <u>an adder for determining an error signal in accordance with the output power of the automatic gain controlled output signal; and</u>

  <u>a gain lookup table for storing gain values, wherein the gain table is adapted in accordance with the error signal,</u> ~~The AGC of claim 23~~ wherein the gain values are set in accordance with a function comprising:

$$g(t) = GHI \exp\left(-b(P_{in}(t) - THQUIET)\right)$$

$$b = \frac{\log GHI - \log GSAT}{THSAT - THQUIET}$$

wherein $g(t)$ comprises the gain values, GHI, $GSAT$ are fixed gain levels, and $THSAT$, $THQUIET$ are threshold values.

Claim 51 (Previously Presented). The AGC of claim 50 wherein $THQUIET$ is approximately 75, $GNOISE$ is approximately 0.1, $THSAT$ is approximately 32000, and $GSAT$ is approximately 0.008.

Claim 52 (Currently Amended). <u>A method for providing an automatic gain control system comprising a gain lookup table with an adaptive gain level comprising the steps of:</u>

  <u>providing an automatic gain controlled output;</u>

  <u>estimating an output power of the automatic gain control system;</u>

  <u>calculating an error signal in accordance with the output power of the automatic gain control system; and</u>

  <u>adapting the gain lookup table in accordance with the error signal,</u> ~~The method of claim 33~~ wherein gain values of the gain lookup table are set in accordance with a function comprising:

$$g(t) = GHI \exp\left(-b(P_{in}(t) - THQUIET)\right)$$

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$$b = \frac{\log GHI - \log GSAT}{THSAT - THQUIET}$$

wherein $g(t)$ comprises the gain values, GHI, $GSAT$ are fixed gain levels, and $THSAT$, $THQUIET$ are threshold values.

Claim 53 (Previously Presented). The method of claim 52 wherein $THQUIET$ is approximately 75, $GNOISE$ is approximately 0.1, $THSAT$ is approximately 32000, and $GSAT$ is approximately 0.008.

Claim 54 (New). An automatic gain control ("AGC") for providing automatic gain control with an adaptive gain level comprising:

an automatic gain control circuit to provide an automatic gain controlled output signal;

an output power block for providing the output power of the automatic gain controlled output signal;

an adder for determining an error signal in accordance with the output power of the automatic gain controlled output signal; and

a gain lookup table for storing gain values, wherein the gain table is adapted in accordance with the error signal,

wherein the gain table is adapted with a new gain value, $G_{new}(q)$ that is computed in accordance with the scaled output signal $P_{out}(t)$ comprising the following function:

$$G_{new}(q) = G_{old}(q) + \beta(\text{set-point} - P_{out}(t));$$

wherein β is a scaling factor $0 < \beta < 1$, the set-point is a desired reference level, $P_{out}(t)$ comprises the output power of the automatic gain controlled output signal, and $G_{old}(q)$ comprises a gain table value.

Claim 55 (New). A method of providing an automatic gain control system comprising a gain lookup table with an adaptive gain level comprising the steps of:

providing an automatic gain controlled output;

estimating an output power of the automatic gain control system;

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calculating an error signal in accordance with the output power of the automatic gain control system; and

adapting the gain lookup table in accordance with the error signal,

wherein the step of adapting adapts the gain lookup table with $G_{new}(q)$ that is computed in accordance with the scaled output signal $P_{out}(t)$ comprising the following function:

$$G_{new}(q) = G_{old}(q) + \beta(setpo\,int - P_{out}(t)),$$

wherein β is a scaling factor $0 < \beta < 1$, the set-point is a desired reference level, $P_{out}(t)$ comprises the output power of the automatic gain controlled output signal, and $G_{old}(q)$ comprises a gain table value.

Claim 56 (New). An automatic gain control ("AGC") for providing automatic gain control with an adaptive gain level comprising:

an automatic gain control circuit to provide an automatic gain controlled output signal;

an output power block for providing the output power of the automatic gain controlled output signal, wherein the output power block comprises a function formed by $P_{out}(t+1) = (1 - \alpha) P_{out}(t) + \alpha|ne_{out}(t)|$ where $0 < \alpha < 1$, ne_{out} comprises an output signal level, and P_{out} comprises an output power level;

an adder for determining an error signal in accordance with the output power of the automatic gain controlled output signal; and

a gain lookup table for storing gain values, wherein the gain table is adapted in accordance with the error signal.

Claim 57 (New). A method of providing an automatic gain control system comprising a gain lookup table with an adaptive gain level comprising the steps of:

providing an automatic gain controlled output;

estimating an output power of the automatic gain control system using a single pole filter comprising:

$$P_{out}(t+1) = (1 - \alpha) P_{out}(t) + \alpha|ne_{out}(t)|$$

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wherein $0 < \alpha < 1$; t comprises a time variable; P_{out} comprises an output power level; ne_{out} comprises an output signal level; and α comprises a time constant;

calculating an error signal in accordance with the output power of the automatic gain control system; and

adapting the gain lookup table in accordance with the error signal.

Claim 58 (New). An automatic gain control ("AGC") for providing automatic gain control with an adaptive gain level comprising:

an automatic gain control circuit to provide an automatic gain controlled output signal;

an output power block for providing the output power of the automatic gain controlled output signal;

an adder for determining an error signal in accordance with the output power of the automatic gain controlled output signal; and

a gain lookup table for storing gain values, wherein the gain table is adapted in accordance with the error signal, and wherein an input power level forms an index to access the gain lookup table,

wherein the index $q(t)$ to access the gain lookup table is formed by a function comprising:

$$q(t) = \left(\frac{TABLE\_SIZE - 1}{THSAT - THQUIET - 1} \right)(P_{in}(t) - THQUIET)$$

wherein $TABLE\_SIZE$ comprises a number of entries in the gain; $THSAT$ and $THQUIET$ comprise threshold levels, and $P_{in}(t)$ comprises an input power level.

Claim 59 (New). A method of providing an automatic gain control system comprising a gain lookup table with an adaptive gain level comprising the steps of:

providing an automatic gain controlled output;

estimating an output power of the automatic gain control system;

calculating an error signal in accordance with the output power of the automatic gain control system; and

adapting the gain lookup table in accordance with the error signal by forming an address to access the gain lookup table as a function of an input power level, wherein forming the address $q(t)$ comprises a function:

$$q(t) = \left(\frac{TABLE\_SIZE - 1}{THSAT - THQUIET - 1} \right) (P_{in}(t) - THQUIET)$$

wherein $TABLE\_SIZE$ comprises a number of entries in the gain lookup table, $P_{in}(t)$ comprises the input power level, and $THSAT$ and $THQUIET$ comprise threshold levels.

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